

AGI and PWV), acute and chronic estrogen replacement improves vascular compliance independently of changes in blood pressure. Hemodynamic benefits of hormone replacement therapy may be particularly evident in these patients with stiff vasculature.

	MAP (mmHg)	HR (bpm)	AGI (%)	PWV (cm/s)
BL	104±14	66±11	38.7±7.8	936±269
ACUTE	103±15	64±15	40.3±7.9	821±213*
CHRONIC	101±14	66±12	36.8±6.5	820±218*

\* = p<0.01

1010-89

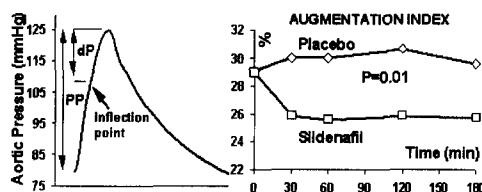
### Sildenafil (Viagra®) Decreases Wave Reflection in Hypertensive Patients

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**Background:** Sildenafil (Viagra®, S) is an effective drug for erectile dysfunction acting on the metabolism of nitric oxide. However, its effects on the cardiovascular system have not been thoroughly studied. Wave reflection (WR) along the arterial tree is an important index of arterial stiffening and cardiac afterload and is inversely associated with exercise capacity.

**Methods:** We studied 17 hypertensives (age 72±7 years) in a randomized, double-blind, cross-over fashion (50 mg of S and placebo). WR was studied using a validated system (Sphygmocor®) that employs (i) high-fidelity arterial tonometry (Millar tonometer) for the non-invasive registration of radial pulse waveform and (ii) appropriate computer software for pulse wave analysis. Aortic pressure waveform was synthesized from the radial waveform using a generalized transfer function. Augmentation index (=dP/PP %, fig.: waveform) was measured as an index of wave reflection. Lower values of augmentation index indicate reduced arterial stiffening and reduced cardiac load and vice-versa.

**Results:** S caused a decrease in aortic systolic and diastolic pressure (by 16.2 and 10.1 mmHg respectively; P<.001 for both). S led to a significant decrease in augmentation index indicating decreased effect of WR from the periphery (fig.: trends).



**Conclusions:** S leads to a decrease of WR in hypertensives. This has important implications for arterial stiffening and the pulsatile load of the heart and may contribute to improved exercise capacity at intercourse.

1010-90

### The Effects of Menstrual Cycle on Cardiac Autonomic Innervation as Assessed by Heart Rate Variability

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**Aim:** A wide spectrum of biological functions is regulated by the cyclic changes in estrogen and progesterone levels during regular menstrual cycle, however little information is available concerning the interrelationship of these hormones and cardiovascular autonomic function. The aim of this study was to investigate the characteristics of cardiac autonomic innervation during the two phases of menstrual cycle by heart rate variability (HRV).

**Methods:** Forty-three regularly cycling non-obese (BMI: 24±1 kg/m<sup>2</sup>) women with a mean age of 29±6 years (range 20-38) were enrolled. The power spectral analysis of HRV was used to calculate low frequency component (0.03-0.15 Hz) in absolute (LF) and normalized units (LF nu), high frequency component (0.15-0.40 Hz) in absolute (HF) and normalized units (HF nu) and LF/HF ratio at the peaks of estrogen and progesterone levels during the menstrual cycle (follicular phase 11±1 days; luteal phase 21±2 days from the first day of bleeding).

**Results:** A significant increase was noted in the LF nu in the luteal phase compared to follicular phase (p=0.014), whereas, a tendency for increased HF nu was observed in the follicular phase (p=0.053). Furthermore, LF/HF ratio was significantly higher in the luteal phase compared to follicular phase (p=0.002), indicating an increased sympathetic activity.

	Follicular	Luteal	P
LF (m/s <sup>2</sup> )	481.5±501.8	559.1±539.5	0.199
LF nu	53.7±12.7	58.2±14.2	0.014
HF (m/s <sup>2</sup> )	384.9±480.8	395.6±351.8	0.842
HF nu	39.7±12.4	36.6±13.9	0.053
LF/HF	1.6±0.9	2.1±1.5	0.002

**Conclusion:** We concluded that regulation of autonomic tone is modified during menstrual cycle. The alteration in the balance of ovarian hormones might be responsible for these changes.

## POSTER SESSION

### 1011 Risk Factors and Endothelial Function

Sunday, March 17, 2002, 9:00 a.m.-11:00 a.m.

Georgia World Congress Center, Hall G

Presentation Hour: 9:00 a.m.-10:00 a.m.

1011-69

### Effects of Intensive Cardiovascular Risk Factor Management on Endothelial Function and Angiogenesis in 'high risk' Hypertensive Patients

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**Background:** Hypertensive patients are at particular risk of vascular complications, which may be related to endothelial dysfunction or abnormal angiogenesis. We investigated these pathophysiological processes in 'high risk' hypertensives and evaluated the response to intensive cardiovascular risk management (blood pressure reducing and if required lipid-lowering therapy) after 6 months.

**Patients and Methods:** We studied 89 'high-risk' hypertensive patients (78 males; mean age 64 years, SD 8.4). High-resolution ultrasound was used to assess endothelium-dependent brachial artery flow mediated dilatation (FMD) following vessel occlusion. Plasma levels of von Willebrand factor (vWf), vascular endothelial growth factor (VEGF) and its soluble receptor (sFlt-1) were analysed by ELISA.

**Results:** There was a significant correlation between FMD and levels of vWf (Spearman, R=-0.517), VEGF (R=-0.314) and sFlt-1 (R=0.328). FMD was significantly correlated with CHD risk according to the Framingham equation (R=-0.624; all p<0.001).

**Conclusion:** Hypertensive patients demonstrate endothelial dysfunction and dysregulated angiogenesis, which improved following intensive cardiovascular risk factor management. Plasma VEGF and vWf levels might be useful tools to identify patients at risk of future cardiovascular events and may assist in the understanding of the early developments in the pathogenesis of vascular risk in hypertension.

**Results**

	Baseline	After 6 months treatment	p-value
total cholesterol [mmol/l]	6.1 (0.9)	5.4 (1.2)	<0.001
SBP [mmHg]	167 (17)	146 (16)	0.004
DBP [mmHg]	91 (9)	83 (10)	<0.001
FMD [%]	4.89 (1.61)	7.33 (2.00)	0.001
vWf [IU/dl]	141 (29)	125 (25)	<0.001
VEGF [pg/ml]	300 (183-1275)	210 (123-588)	<0.001
sFlt-1 [ng/ml]	5.2 (1.7-13.5)	7.2 (2.3-17.6)	<0.001

1011-70

### Socioeconomic Status and Cardiovascular Risk Factors in a Brazilian Young Population Followed Up for a 10-Year Period: The Rio de Janeiro Study

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**Background:** Low socioeconomic status (SES) has been related to hypertension and other cardiovascular risk factors and predicts poor outcomes in adult populations. We investigated the aggregation of high blood pressure (BP), overweight, metabolic abnormalities and left ventricular mass (LVM) in young subjects, according to their school's SES obtained 10 years earlier.

**Methods:** 385 young subjects (201M) were evaluated at their schools in 1987-88 (12.74±1.65 y). BP was measured 3 times, and the third measure was used for analysis. Body mass index (BMI) was obtained. In 1997-98 (21.91±2.12 y), they were examined at the hospital. BP and BMI were obtained and cholesterol (C), triglycerides, LDL-C, HDL-C, glucose and insulin were measured after a 12h fasting. LVM was obtained by echocardiography, using the Penn's formula. The sample was stratified according to school's SES (low, medium, high), reported by Secretary of Education for Rio de Janeiro, regarding parents' occupation and monthly income. G1: low SES (n=68, 29M); G2: medium SES (n=141, 83M); G3: high SES (n=176, 89M). Comparisons were adjusted for age and sex. Risk factors considered were: BP ≥ 140 and/or 90 mmHg, glucose ≥ 110 mg/dl, BMI ≥ 25 kg/m<sup>2</sup>, insulin ≥ 30 mIU/ml, smoking, familiar history of myocardial infarction at early age and any alteration of lipids.

**Results:** 1) G1 had higher diastolic BP at school than G2 and G3 (p<.03); 2) After 10 years, G1 had higher systolic (p<.02) and diastolic BP (p<.01), positive BMI variation between the two evaluations (p<.01), LVM (p<.04) and LVM index (p<.01), and lower HDL-C (p<.05) than G3; 3) Ten years later, compared to G3, G1 had higher prevalence of hypertension (27.9X17%), overweight (35.8X25%) and hyperinsulinemia (6.7X3%) (p<.05); 4) In G1, 36.5% had 3 risk factors or more, compared to 27.6% in G2 and 22.4% in G3 (p<.01); 5) In logistic regression, male sex, low SES, high BP and overweight at school were significantly related to hypertension in a 10 year-period (RR=3.97, 1.47, 2.58, 2.93, respectively; p<.05).

**Conclusion:** School's low SES was associated to overweight, higher BP and LVM, lower HDL-C and high risk factor aggregation in Brazilian young subjects, 10 years later.